Nordic/Baltic Regional ESTH Hub e-Letter

Welcome to the latest e-Letter, our *unclassified* electronic publication sharing regional information, news and events. We encourage you to visit the websites of our Embassies throughout the Hub. Feel free to disseminate to your contacts. At the very end of the e-Letter you will find our featured story, offering background on Combined Heat and Power (CHP).

Enjoy the read!
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AROUND THE REGION…..

DENMARK

Arctic Council Ministerial. The Arctic Council Ministers recently convened in Nuuk, Greenland. The eight Arctic state ministers were joined by representatives of six indigenous peoples' organizations. Secretary Clinton led a high-level U.S. delegation that included Interior Secretary Salazar, Senator Murkowski, Ambassador Fulton, OES Assistant Secretary Jones, Interior Deputy Secretary Hayes and Alaska Lt. Governor Treadwell. The Council, an intergovernmental forum among the Arctic states, promotes extensive Arctic issue coordination and cooperation.

The Ministers signed the Agreement on Cooperation in Aeronautical and Maritime Search and Rescue in the Arctic (the "SAR Agreement") and the Nuuk Declaration. The SAR Agreement is the first legally-binding instrument negotiated under Council auspices. The Declaration discusses several issues affecting the Arctic, including climate change, environmental protection, health, science and climate monitoring. Additionally, a permanent Arctic Council secretariat will be established in Tromsø, Norway. Denmark also passed the two-year Council chairmanship to Sweden. For more information on the Arctic Council Ministerial outcomes, read here and here. (Photo: Amb. Fulton, Greenland Premier Kuupik Kleist and Secretary Clinton in Nuuk, State Dept.)

Denmark tops list of clean technology producers. Denmark derives 3.1 percent of its gross domestic product from clean technologies. Read more here.

Copenhagen wins EU grant to optimize plastic recycling. The EU funding authority for innovative environmental projects has chosen Copenhagen municipality's technical and environmental department to lead an international collaboration. This collaboration, increasing plastic recycling, is projected to reduce plastic in the waste stream and provide an alternative for plastic packaging. International partners include the cities of Malmö and Hamburg, and the Latvian waste management companies Liepajas RAS and Getlini EKO. The project is expected to run from September until 2013. Read more here.

Electric vehicle power sell-back. The U.S. company Nuvve plans Denmark as a test market, allowing electric vehicle (EV) owners to sell energy stored in their cars back to the grid. The pilot program will consist of 30 cars. According to Nuvve, participating EV owners could earn up to $10,000 over the car's lifetime. Read more here and here. (*Source: greentechmedia.com)*

Reports expect faster sea rise from Arctic melt. A new report from the Arctic Monitoring and Assessment Program, the scientific arm of the Arctic Council, finds significant increased Arctic ice melt. The report was launched during a recent sustainability conference in Copenhagen titled "The Arctic as a Messenger for Global Processes." This could lead to as much as 5 feet of sea-level rise this century. These finding are dramatically higher than earlier projections. Read more here.

ESTONIA

Eesti Energia and General Electronic to establish wind energy park. The two companies agreed to build a 22.5 megawatts (MW) wind energy park on the Pakri peninsula for nearly 33 million Euros. The park is expected to be completed in 2012 and will consist of nine wind generators. Read more here.
(*Picture: Wind Energy Park, Baltic-course.com)*

Estonia rated by Eionet the second-best in Convention air pollution reporting. Under the 1979 Geneva Convention on Long-Range Transboundary Air Pollution, Convention members must send yearly reports to the European Environmental Information and Observation Network (Eionet). Annual rankings take into account punctuality, data quality, time series length and data stream comprehensiveness. Estonia also received the "most improved" honor. Read more here.

New waste-to-energy unit will provide heat and electricity. Eesti Energia's new combined heat and power plant (CHP) at Iru will cost 100 million Euros and be able to incinerate the majority of household waste generated each year. In two years it may provide 50 MW of heat and 17 MW of electricity. The plant will mainly provide heat to Talinn and Maardu. Read more here.

New oil shale-based power station postponed. While not opposed to the new station, Eesti Energia seeks certainty as to how the Estonian government will support the project. Originally, the Estonian government intended to provide project grants. However, these were in contrast to European climate policy, and disallowed. Read more here.

FINLAND

Arctic ice meeting. At a June 14th Helsinki event, Research Institute of the Finnish Economy members and industry representatives discussed the implications of thinning Arctic ice. Increasing temperatures are expected to open the Northeast Passage to year-round sea traffic, making the distance to the Far East around Siberia shorter. Year-round navigation of the Northeast Passage is currently possible, but not economically profitable. Read more here.

Fortum to build two biofuel power stations. The Finnish government-controlled utility company Fortum announced the construction of two biofuel-fired heat and power stations in Finland and Latvia. The total investment is worth about 160 million Euros. The new plants are expected to decrease carbon dioxide emissions. Read more here.

Finland hopes to export electricity to nuclear-free Germany. The German government's decision to shut down domestic nuclear plants by 2022 is creating hope that Finnish electricity exports will rise. The Finnish Energy Industries Association advocates constructing more domestic plants that focus on exporting electricity. Transmission lines between Germany and Finland are expected to be completed in the early 2020s, as the German power plants close. Read more here.

GERMANY

Germany launches Baltic Sea offshore wind park. The wind park Baltic 1, which has a capacity of 48.3 MW, opened on May 2nd. Baltic 1 has the capacity to supply 50,000 households with electricity. The German government plans to have 10,000 MW of offshore wind power capacity installed by 2020. Read more here.

Germany's Ferrostaal offered deal to build CHP plant in Zenica, Bosnia. A consortium, including Ferrostaal and Austria's Christof Group, will build a gas-fired CHP plant with an electrical capacity of 240 MW and a thermal capacity of 170 MW. The plant is slated to cost $351 million. Read more here. For more information about CHP and district heating, please note our featured story at the end of the newsletter.

Siemens developing wind turbine without gears. In an attempt to decrease the maintenance needed on wind turbines, Siemens AG developed a "direct-drive" design which eliminates gears. Gears remain the major cause of turbine outages. Full-scale production is planned for 2014. Vestas, Siemens' biggest competitor, will continue using traditional turbines with gears. Experts fear that the "direct-drive" technology has not been fully tested. Read more here and here.

ICELAND

Iceland to import more than 1,000 electric vehicles. Northern Lights Energy, an innovative Icelandic firm, is working together with AMP Electric Vehicles to import more than 1,000 electric SUVs to Iceland. U.S. Ambassador to Iceland, Luis E. Arreaga, celebrated the arrival of the first cars with a test drive. The vehicles will be used by fifty Icelandic companies and government offices. AMP is also planning to sell electric SUVs to Finland, Sweden, Norway, Denmark and the Faroe Islands. Read more here. *(Picture: AMP electric SUV, green.autoblog.com)*

Iceland post wins 2011 "Billion Acts of Green" contest. In recognition of Earth Day, the U.S. State Department, together with the Earth Day Network, launched a contest in which members of the State Department community made commitments to make their lives "greener." The U.S. post in Reykjavik had the highest employee percentage of participation. Read more here.

LATVIA

Latvia to launch first satellite. Latvia is to launch its first telecommunication satellite, Venta-1, by the end of 2011. Initially set for launch in 2009, the new satellite was designed to automatically identify and facilitate the geographical spotting of objects. The approximately $700,000 project has the support of Latvia's Ministry of Education and Science. Read more here.

Latvia purchases MERLIN Aircraft Birdstrike Avoidance Radar system. The Merlin unit was purchased with EU structural funds for Riga International Airport (RIX). The Merlin system uses cutting-edge solid state S-Band Doppler radar technology. This detects and provides real-time bird flight pattern information to air traffic control systems. Merlin assists avoiding bird-aircraft strike hazards, which caused the January 2009 U.S. Airways "Miracle on the Hudson" aircraft accident. RIX's Merlin unit is the only one of its kind at civilian airfields in Europe. Given Latvia's location along important bird migration routes, the Merlin unit will enhance RIX's overall safety profile. Read more here and here. *(Picture: MERLIN Radar System, riga-airport.com)*

Latvia to clean pollution in Sarkandaugava with Swiss support. On June 16, the project "Sanitation of Historically Polluted Places in Sarkandaugava" was initiated. Main project goals are to remediate Sarkandaugava, increase investments in environmental improvements and create a new business zone. The pollution was linked to the storage of Soviet military oil products. Switzerland will provide financial assistance and knowledge-based expertise. The project is expected to be completed by 2017. Read more here.

LITHUANIA

Lithuania to build nuclear power plant. Lithuania has received two bids from Japan's Hitachi-GE Nuclear Energy and the U.S. Westinghouse Electric Company to build a nuclear power plant. The country seeks to replace its Soviet-era plant, which closed in 2009. The planned maximum capacity of the plant is 1,300 MW, with projected online status in 2020. Read more here and here.

International safety standard compliance. A high-level nuclear safety conference occurred. The International Atomic Energy Agency (IAEA) event, dedicated to analyzing and assessing the Fukushima Daiichi nuclear power station accident in Japan, included a Lithuanian delegation. Lithuania questioned the IAEA compliance of Russia and Belarus, while also advocating for a legally-binding nuclear safety standard. Read more here.

Nordic Investment Bank backing for first CHP plant. Finland's Fortum is ready to build a 140 million Euro CHP plant in Klaipeda, Lithuania with half the funding provided by the Nordic Investment Bank. The new Lithuanian plant will be fuelled by municipal solid waste, non-hazardous industrial waste and biomass. The plant is expected to be operational in the beginning of 2013. Its future output capacity is intended at around 60 MW of district heat and 20 MW of electricity, which will be sold to the Lithuanian

national grid. Switching to combined heat and power production will help increase energy production efficiency and lower regional greenhouse gas emissions. Read more here.

NORWAY

New report describes potentials and challenges for European forests. The "State of Europe's Forests 2011" report was presented at the June 14-16 *Forest Europe* conference in Oslo. The report concluded that Europe's forests absorb about 10% of the EU's annual emissions, but are undergoing threats from nitrogen deposition, disease and insect infestations. At the conference forty-six member countries and the EU discussed issues affecting forests and society in Europe and throughout the world. High on the agenda was the elaboration of a strengthened policy framework for sustainable forest management throughout Europe. The ministers also discussed entering into negotiations on a legally binding agreement on forests in the pan-European region. Norway held the chairmanship of *Forest Europe* through the conference. Read more here.

Norway sends funds to Poland. Norway is transferring a record amount of 578 million Euros to Poland, targeting social and environmental issues, following a signed agreement between Norwegian Prime Minister Jens Stoltenberg and Polish counterpart Donald Tusk. The funding is part of Norway's financial obligations as an EU Free Trade Area member. Read more here.

Huawei and Telenor launch Arctic Circle Long Term Evolution (LTE) site. Huawei, the telecom solutions provider, announced teaming up with Telenor Norway to jointly launch the world's northernmost LTE site. Read more here.

POLAND

Shale gas conference hosted in Warsaw. The U.S. Embassy in Poland and the Polish Ministry of Foreign Affairs jointly hosted a Conference entitled "Shale Gas: Managing Europe's Emerging Resources." The conference focused on the potential of shale gas development in Poland and its impact on regional energy security. The U.S. and Polish governments are working together to meet the challenges of environmentally responsible shale gas extraction. A recent U.S. Energy Information Administration report estimates that Poland has significant shale gas resources, which could cover Poland's annual gas consumption for over 300 years. Read more here.

U.S. and Poland welcome intensified energy cooperation. President Obama and Poland's Prime Minister Donald Tusk met in Warsaw, with focus on energy cooperation and climate security. Both welcomed strengthened cooperation between their governments and the private sector in the development of unconventional sources of energy. The leaders also reaffirmed the importance of

combating climate change, particularly as an important aspect of energy security. Read more here.
(Picture: President Obama and Poland Prime Minister Donald Tusk, state.gov)

RUSSIA

Tenders to clean up Franz-Josef Land and Spitsbergen. The Russian Ministry of Natural Resources and Environment announced that tenders will clean up polar island waste left by the Ministry of Defense and research stations. Waste items include vehicles, buildings, metal wastes and thousands of tons of petroleum products in barrels and reservoirs. Clean-up work on Spitsbergen is scheduled to take place from 2011 to 2013. The first priority will be the raising of sunken equipment that poses a threat to shipping. Plans are to eliminate a total of 7,700 metric tons of waste. Read more here.

St. Petersburg Adopts Long-Term Water Program. The St. Petersburg governor's press office announced the implementation of "Clean Water St. Petersburg." The program, from 2012 to 2025, includes the development of the city's water provision system and the region's water treatment system. The program calls for the development of uninterrupted provision of potable water to city residents, the reduction of the volume of water used per resident, cleaning-up local bodies, ending dumping into Baltic Sea aquifers and promoting wastewater recycling (resulting in energy production). The city notes that this is one step toward St. Petersburg's "green revolution." Read more here.

New Bills for Russia's Environment. At a meeting of the Presidium of the State Council on Environmental Issues in Dzerzhinsk, Natural Resources and Environment Minister Yuriy Trutney presented six bills designed to provide Russia with a new system of requirements for environmental safety, including one which would provide economic incentives for businesses to engage in environmentally-responsible practices. During the meeting, Igor Chestin, director of World Wildlife Fund-Russia, raised concerns about environmental damage from the construction of Olympic facilities in Sochi. President Medvedev reaffirmed his willingness to enforce environmental standards at the site. Read more here and here.

SWEDEN

Swedish Absalicon awarded prize at Intersolar conference. The Swedish company Absalicon from Härnösand has been awarded "Most Interesting Solar Thermal Technology" during the Intersolar 2011 conference in Munich. Absalicon sun collectors have been developed for large buildings, such as factories, hospitals and hotels. Read more here.

GE wins 100MW Sweden deal from Stena. The renewable arm of Swedish industrial giant Stena signed a contract to deploy 40 of GE's 2.5-100 wind turbines for installation at four new wind farms in the south of the country. Stena currently operates a total of 22 wind turbines in the municipalities of Ludvika and Härnösand in central Sweden. The new projects represent a total investment of 1.2 billion SEK. The four new wind farms will be supported through Sweden's existing green certificate support system that gives producers of renewable electricity set payments for every produced MW of renewable energy. Read more here.

Sweden's Alfa Laval to provide heat exchangers to largest concentrated solar power plant in the United States. Swedish company Alfa Laval received a U.S. order to provide heat exchangers to the world's largest concentrated solar power plant. The Alfa Laval *Packinox* heat exchangers, set for 2012 delivery, will be the center of the thermal storage system. There, heat from solar power is stored in molten salt, enabling electricity production even on rainy days or at night. Read more here. *(Picture: Concentrated Solar Power Plant, America.gov*)

EUROPEAN UNION

EU vote likely about carbon-permit auctions in July. European Union nations may decide in July how many carbon-dioxide permits to sell at early auctions in 2012. The EU wants to gradually phase-out free allowances to limit price shocks. About 60 percent of all permits will be auctioned in 2013 and this percentage is expected to increase in the next years. Revenues from the sale will be used to finance clean-energy projects. Read more here.

Airlines and Emissions. European Union top climate policymaker Connie Hedegaard recently countered arguments that the inclusion of the aviation sector in the European Emission Trading Scheme would be against international law and would impose high costs. Read more here.

UNITED STATES

Department of Energy Releases 2011 Strategic Plan. The DOE released its new strategic plan to guide the agency's core mission. The report is available here. For additional information, see here.

Obama Administration pushes clean energy exports. Obama Administration officials urged Congress to protect programs that boost U.S. exports, including those of clean energy technology. An interagency report pointed out some $400 million in assistance meant to help federal agencies increase U.S. commerce abroad.

California's clean air regulators turn to cars. Regulations to cut down emissions from California's cars are seen as a important way to reach the state's target of reducing emissions to 1990 levels before 2020. A proposed emissions standard for cars and light-duty trucks on both the federal and state level is forthcoming at the end of September. Read more here.

Flywheel energy storage plant. On July 12, Beacon Power will open the world's first 20 MW flywheel-based frequency regulation plants. This project is part of the 100 Projects that are changing America and received a $43 million loan guarantee. The main function of the plant is frequency regulation and energy storage. This is expected to increase the stability and reliability of New York State's electric grid and generate jobs. The plant will reduce carbon dioxide emissions by 82% compared to coal or gas plants and will not emit air pollutants like nitrogen dioxide or sulfur diode. Read more here. (Picture: *The Beacon 100 Flywheel Energy Storage Plant, cleantechnica.com*)

Senate votes to end ethanol subsidies. The Senate voted to eliminate extensive U.S. ethanol industry support. The vote included both the .45/gallon subsidy to refiners and the .54/gallon tariff on imported ethanol. Read more here.

Google to finance residential solar products. Google will help thousands of American homeowners with the large upfront investments needed to install solar panels on their roofs. Homeowners are required to pay a monthly rent instead, which will be offset by energy bill savings. Google will finance $280 million in total. Read more here.

Solar power's potential in New York mapped. A map created by a team from The City University of New York, together with City and Department of Energy officials, shows the potential for each of the buildings in New York. According to the map, solar panels on certain rooftops could supply half of the city's demand for electricity in peak periods. Read more here.

Defense Department Services monitor Arctic melting. The Arctic is a place of great national security and strategic importance that the Defense Department and services are monitoring closely. In a report sent to Congress, DOD officials note that rapid climate change and increased human activity, including oil and gas exploration and tourism, could affect U.S. Arctic interests. Read more here.

UAF research looks to heart of rehab. Scientists believe research on hibernation of black bears and ground squirrels at the University of Alaska Fairbanks' Institute of Arctic Biology could contribute to treatment of heart attacks and strokes in humans as well as the long-term recovery of people after surgery and of soldiers' recovery from battlefield wounds. Read more here.

EVENTS

August 21-28 2011. Svalbard, Norway: Summer school on climate change impacts. Read more.

September 5-9 2011. Hamburg, Germany: 26th European Photovoltaic Solar Conference and Exhibition. Read more here.

October 11-12, 2011. Copenhagen, Denmark: Global Green Growth Forum, by Danish Government. Read more.

FEATURED STORY

What is Combined Heat and Power?

Combined Heat and Power (CHP), also known as cogeneration, is the simultaneous production of both electricity and heat from a single fuel resource. By the use of a waste-heat recovery system, heat which would otherwise be lost under traditional energy production methods is captured and stored as hot water or steam. As a result, efficiency levels can be raised from 34% in a traditional plant to up to 89% for a CHP plant. The heat that is captured is used for district heating, commercial buildings or industrial processes. In Finland, for example, about 75% of the district heat is provided by CHP plants.

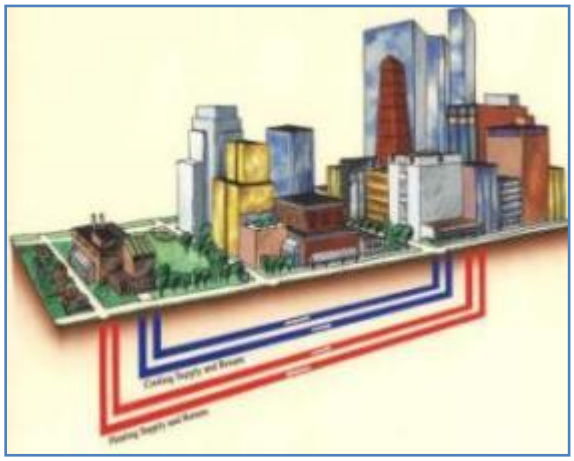
A multiple fuel source plant owner has the flexibility to change the fuel used according to prices. CHP can be used with a wide variety of energy sources, including natural gas, oil, coal, biomass, biogas and

waste. Further, CHP schemes are not limited to large-scale plants, as CHP units can range from small engines to a district heating system. Note that district heating is a system for distributing heat generated in a centralized location for residential and commercial heating requirements such as space heating and water heating.

CHP Potential, Benefits

With the use of CHP, up to 30% of fuel could be saved while simultaneously lowering pollution and greenhouse gas emissions. In addition, CHP can increase the reliability of the power system by shifting to local power generation and decreasing the stress on the overall electricity grid. CHP can be seen as also improving energy security. The biggest CHP potential exists in locations where power generation takes place, close to sites where heat is used. Alternatively, efficiency is greatly reduced when heat is transported over long distances through pipes (See Figure 2: Example of CHP System Source.) Thus, CHP is most efficient in densely populated cities.

United States: CHP on the Move



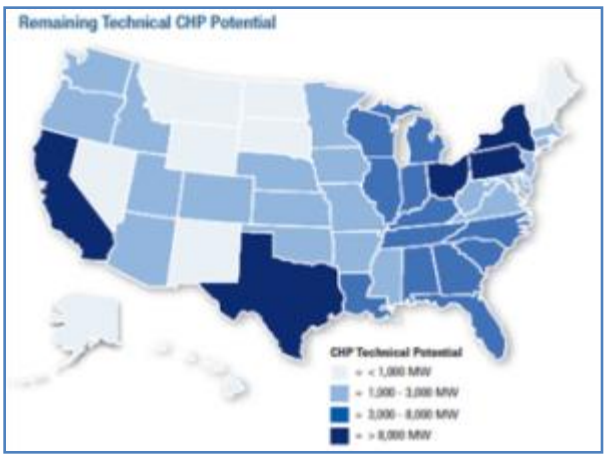
Traditionally, the U.S. has maintained a network of centralized power plants, built around domestic policies to promote a century-old local electrification policy. Despite this policy's implications, an increasing number of states have looked to CHP potential--with nearly 8% of U.S. electricity produced by CHP systems. CHP is currently used the most in California, Louisiana, New York and Texas due to their thermal energy-dependent industrial sectors. In particular, New York and California have high industrial demands, strict air quality requirements and policies that further encourage CHP adoption.

CHP could yield significant efficiencies. The average thermal power plant in the U.S. has an efficiency of 34%, which means that approximately two-thirds of the energy produced is "lost" as heat. In fact, the total annual energy *lost* through heat from power production in the U.S. is *higher* than Japan's total annual energy use. Indeed, CHP benefits are wide in scope. According to a report prepared by the Oak Ridge National Laboratory, increasing the United States' CHP capacity from 12 to 20% until 2030 could save a total of 5.3 quadrillion BTU of fuel annually, generate $234 billion in new investments, create nearly 1 million new high-skilled jobs and reduce CO2 emissions by 800 million metric tons per year. This would result in a 60 percent reduction in the expected growth of total national CO2 emissions from now to 2030. Overall, CHP production combined with district heating is one of the most energy efficient and low-carbon ways to produce power and electricity, while enhancing energy security.

CHP Projects Gain Steam

State-led CHP projects are diverse in scope. A recent $377 million expansion at the Texas Medical Center, includes the largest district cooling facility in the United States. The expansion is expected to save the Thermal Energy Corporation and its customers more than $200 million over the next 15 years. The CHP unit will increase operating efficiency to 80%.

In California, for example, CHP is recognized as an important technology to reach the emission reduction targets of the Global Warming Solutions Act of 2006. New Jersey has described CHP as the key solution to meet the state's environmental and energy goals in their Energy Master Plan from 2008. Massachusetts has a scheme to increase the amount of energy produced from renewable sources, which led to a 58% increase in electricity produced by CHP plants.



From a federal perspective, the U.S. Department of Energy has set goals to increase CHP use to 20% of total generation capacity. This goal is viewed as attainable, given several European countries already have a CHP capacity of over 20%. Even though population densities are generally higher and the climate is different than European cities, there is significant CHP potential throughout the U.S. (see Figure 3: Remaining U.S. CHP Potential Source).

Europe and CHP

The EU currently generates 11% of its electricity through CHP plants, although this varies widely between 2% to 60% for different member states. Additionally, the EU issued a Directive which intends to promote and develop high-efficient CHP. Since 2006, EU member states are obliged to produce reports covering the state of CHP in their countries, promote CHP and remove barriers to CHP development. The EU CHP Directive includes feed-in tariffs, grants, loans and tax incentives to support member states with compliance.

Regional Trends

Regionally, CHP plays an integral role. Denmark, Finland, Russia and Latvia are the largest CHP users globally. A particularly new and innovative development in Denmark is taking place at the National Laboratory for Sustainable Energy. Solid-oxide fuel cells (SOFCs) produce energy and heat from hydrocarbons, biofuels, or hydrogen with a very high efficiency. As the future electricity system will have to accommodate more renewable energy, SOFCs could provide electricity to homes when there is a lack of wind or sunlight. At the same time, they provide heat for households.

Finland shows how CHP and district heating can be combined to optimize fuel use. The country has aggressively pursued the integration of these two systems with the result that almost 50% of all space heating derives from district heating. In addition, 75% of the heat provided is derived from CHP plants. The construction of a modern, efficient and accessible district heating network and the ability to sell electricity to the grid was key to Finnish success. Helsinki tops the chart, where 92% of the heating demand is supplied by district heating, and 92% of the electricity derives from CHP plants.

Finally, Sweden and Finland (in addition to the U.S.) participate in a working group under the Global Superior Energy Performance Partnership (GSEP). The GSEP is a Clean Energy Ministerial initiative, which is an international forum with a goal to accelerate the transition to clean energy technologies.

Further Reading

For basic information about CHP, visit **http://www.epa.gov/chp/basic/index.html** and **http://www.cogeneurope.eu/category/cogeneration/what-is-cogeneration/.**

For information about district energy, read more at **http://www.districtenergy.org/what-is-district-energy.**

Read EPA's report on state level CHP support **here.** For reports on CPH, read **here** and **here.**

To read more about small-scale CHP production, visit **http://www.cogeneurope.eu/category/cogeneration/micro-chp/** and **http://fuelcellsworks.com/news/2010/11/29/sofc-micro-chp-plants-to-be-climate-friendly-power-stations-in-homes/.**

For more about CHP across the U.S., see **http://www.powermag.com/smart_grid/Combined-Heat-and-Power-Across-the-U-S-_3138.html .**

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